The Health Effects of Downsizing in the Nuclear Industry

Los Alamos National Laboratory

Executive Summary

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Copies of the complete report are available in the Los Alamos Department of Energy Reading Room or contact Shirley Fillas, with University of California (505-665-1175.)

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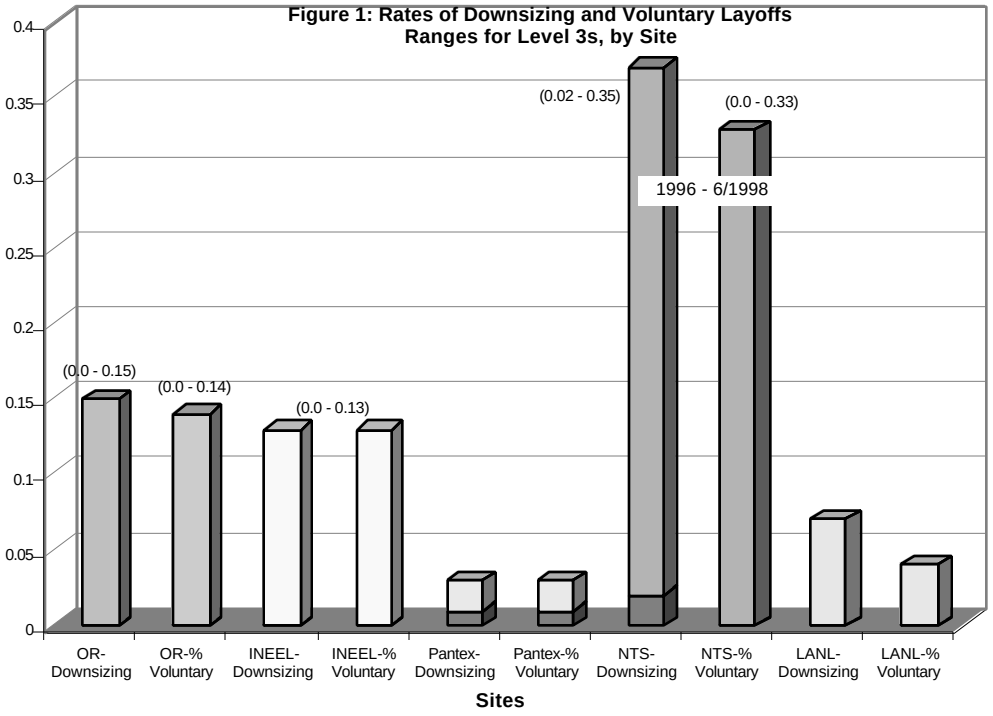
Organizational restructuring within the defense industry prompts research on health effects.

The dissolution of the Soviet Union and the ending of the Cold War in 1992 resulted in marked shifts in United States military strategy and budgets. Consequently, Congress passed Section 3161 of the National Defense Authorization Act for Fiscal Year 1993 outlining an approach to workforce layoffs in the nuclear weapons industry. Since then, there have been 46,000 layoffs of contractor employees at Department of Energy sites. More than 14,000 employees were downsized from the five study sites between September 1991 and September 1998 through voluntary and involuntary layoff events. In 1999, employment at the five sites was from nine to sixty nine percent lower than the highest employment level during the 1990's. The downsizing rates for each of the sites, including overall downsizing and the extent to which layoffs were of a voluntary nature, are presented below in Figure 1.



To better understand the impact of such downsizing and other organizational changes on both the remaining workforce and those who lost their jobs, the U.S. Department of Energy (DOE) and the Centers for Disease Control (CDC) solicited research proposals.

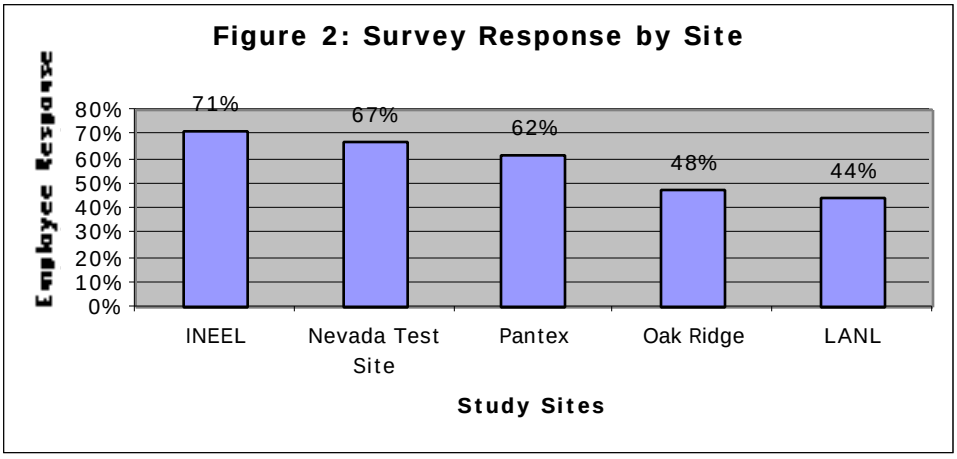
Boston University School of Public Health, with funding from the National Institute of Occupational Safety and Health (NIOSH), was selected to study and recommend ways to mitigate the impacts of workforce reductions on individual and organizational health.

This study required enormous cooperation. Our biggest thanks are to the nearly 6,000 employees who participated in focus groups or interviews and completed surveys, and to those supervisors who helped make that possible. This report was peer reviewed by two experts in the field of workplace stress and psychosocial research.

Boston University School of Public Health study is most far reaching of its kind.

Our research, covering the period from 1991 through June 1998, is the largest of its kind--in both scale and scope--to investigate the health and organizational effects of workplace restructuring. Marrying the disciplines of public health, organizational psychology and organizational management, we used several methodologies and designed a multi-level research model to best capture the complexity and variety of relevant data.

In our survey, which was only one piece of the data collection, we sampled 10,645 employees from our five study sites (or 43% of all eligible employees at those sites). We received an overall response of 55% and at LANL, only 45% of the sample or 1,570 employees (1,396 UC, 96 JCNNM and 78 PTLA) completed the survey. This represents a lower return rate than the other sites although if we eliminate the subcontract employees (JCNNM) not included in the analysis, the response rate increases to 49.2%. Figure 2 compares response rates by site.



Globally, downsizing and organizational restructuring have become common management tools, used to improve operational and fiscal efficiency. However, little is known, about the effects of these tools on employee health or organizational effectiveness. Therefore, the knowledge sought through this research is important for employees, unions, and other employee organizations, contractors and federal entities managing organizational change in DOE facilities, as well as for those in other industries.

We identified and investigated four key issues in downsizing, reorganization and health.

2) Downsizing will have a negative effect on individual health and workplace functioning (i.e., employee morale, work performance and job security).
3) Employees are less likely to experience negative health effects and organizations are more apt to function normally the fairer the downsizing process and the fewer direct elements of downsizing the employee experiences.
4) During periods of organizational change, one's work and work environment, including job strain*, organizational style, co-worker and supervisor support, and workplace safety will affect both individual health and workplace functioning.

. **Definitions of terms**

Job strain measures both the "demand" one experiences at work (physical and psychological) and the "control" an employee has over work tasks, where job control refers to the ability to structure your work, feel challenged and use your skills and training. Job strain is measured using three scales: the job demands scale, the decision authority scale and the skill discretion scale.

Organizational style refers to managerial and leadership approaches, with particular attention to how relationships and problems are handled. We looked at the company's organizational style using four scales on: 1) handling conflict, 2) the relationship with the DOE, 3) how management communicates with employees, and 4) workplace violence.

Organizational climate is used here as an umbrella term for work environment issues. We include the components of organizational style listed above (four scales) as well as co-worker and supervisor support and workplace health and safety (three scales measuring general safety, toxic exposure and exposure to noise).

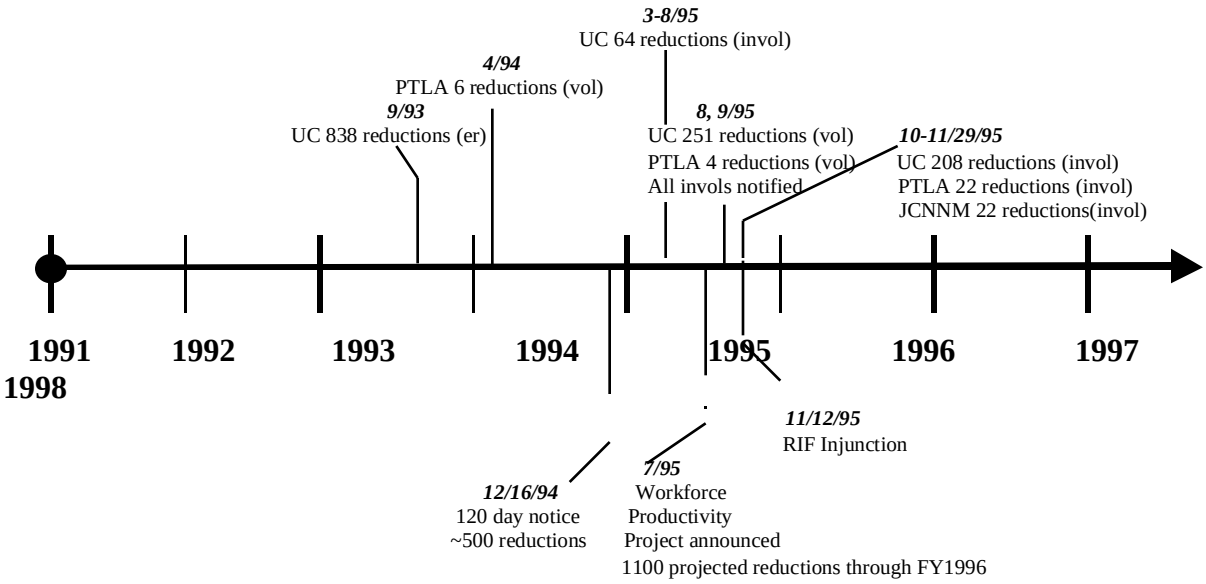
5) Workplace factors including job strain, organizational climate, and the employee's perception of the fairness of the downsizing process can moderate the impact of downsizing on health and organizational outcomes.

Findings at Los Alamos National Laboratory Demonstrate Need to Develop Interventions for Improved Employee Health.

The downsizing history at this site is important because even though the number of individuals downsized is relatively low, the impact from the downsizing event was extremely high; including a group action lawsuit. The downsizing hisotry is captured in the following timeline (Figure 3).

Los Alamos National Laboratory was chosen as a study because it is a large facility, it is a multi-program laboratory, it is located in a rural setting and the University of California is a primary employer for the region offering the highest pay scale. LANL has had a single managing contractor, the University of California, since its inception and is one of a few DOE sites managed by a university and not a private corporate entity.

Timeline of Downsizing and Restructuring Events at LANL



Workforce Reduction Type
vol= voluntary incentive, non early retirement
er= early retirement
invol= involuntary

Our research yielded the following five site-specific findings at Los Alamos National Laboratory.

1. Employees who perceived that downsizing was implemented with clearly explained reasons, worker input, open, respectful, truthful and unbiased communication with employees, and consistent and fair rules experienced fewer negative health effects.
    - A process perceived as just and fair was associated with fewer reported medical symptoms and conditions.
    - Greater fairness was associated with fewer survivor syndrome symptoms.
    - The more fair the downsizing, the more secure employees were in their jobs.

2. Employees who reported more direct experiences of the downsizing performed worse on six of the nine outcome measures.
    - A higher score on the downsizing experiences index was associated with more medical symptoms and conditions.
    - These employees had lower mental health scores (MCS) and reported more survivor syndrome symptoms and higher perceived stress.
    - The more downsizing elements experienced, the greater the job insecurity.

3. Employees who experienced greater job strain reported an increase in adverse individual and organizational functioning outcomes.
    - Workers with higher job strain reported a greater number of medical symptoms.
    - Higher job strain was associated with poorer mental health status, more survivor syndrome symptoms and higher perceived stress.
    - Morale and job security were lower for employees who reported high strain.

4. Job characteristics, workplace safety and organizational relations were frequently associated with our study outcomes.
    - Matrixed employees who experienced difficulty with this job structure also reported significantly more health problems (symptoms and conditions), worse mental health (all three outcomes) and more job insecurity.
    - The perception of a safe and healthy workplace with no consistent danger of toxic exposure is predictive of better overall physical health, fewer medical conditions, a more secure job future, better work performance and higher employee morale but also with a lower overall mental health score.
    - Employees who felt their management had a more effective and smoother relationship with the Department of Energy reported fewer medical symptoms and better overall mental health (MCS) were less likely to report survivor syndrome and felt that employee morale was higher.

5. People of color (non-whites/Latinos) working at LANL appeared healthier on several of our outcome measures although there were also many reports of discriminatory treatment.
    - People of color reported fewer medical conditions and better mental health (on all three measures) as well as fewer instances of poor work performance.
    - Many employees raised issues of discrimination, particularly against Latinos and subcontractor employees (who are more likely to be non-white than UC employees) in matters of promotions, job performance reviews, the selection for downsizing, and the daily work environment.

6. Employees expressed some consistent concerns in employee discussion groups, interviews and comments written on the surveys. We heard that:
    - management at LANL/UC contains many exceptional scientists rewarded for their work with promotions but they are often unable to effectively manage personnel and the organization due to a lack of formal training. Many managers were described as being poor communicators and not active participants in improving the team atmosphere among their employees;
    - PTLA upper management was seen as being very involved with the workforce and being a visible force around the site and actively soliciting employee input whereas mid-level managers were not as visible. PTLA workers expressed satisfaction with this process;
    - downsizing resulted in more work for survivors and the resultant work groups were less cohesive due to large workloads, multiple job responsibilities, and the loss of key skills and knowledge;
    - there was a perceived inequality, technical vs. non-technical, educated vs. non-educated, scientist vs. technical support, Latino vs. Caucasian, contractor vs. subcontractor, strongly affected the organizational climate at the Laboratory.
    - safety was of primary importance as a result of a few severe accidents at the site, however, many UC employees felt that mandated documentation was excessive, creating inefficiencies in work processes.

Los Alamos findings are similar to findings at four other study sites.

At all five sites, our survey, focus group and interview data show the importance of a fair and just downsizing process on employee health. LANL experienced less downsizing, as measured by rate, than three of the other sites in the study. Downsizing events took place at the beginning of the 1990s and then in the 1994-95 period. However, LANL is also the site where employees reacted most negatively to the layoffs and the process used to carry them out. The more elements of downsizing that individual employees experience, the more likely they are to suffer negative effects, particularly related to medical symptoms, overall mental health

and job security. At LANL, unlike the other sites, the personal experiences of downsizing also was associated with survivor syndrome with employees reporting more symptoms. High job strain had negative effects on employee health and organizational functioning at all of the study sites, each in its own stage of downsizing.

While the experience of violence or harassment predicted negative outcomes at three sites, it did not emerge as important at LANL. Support from one's supervisors and co-workers was not perceived as particularly important at LANL.

Study employs various methods to understand the complexity of downsizing and organizational change.

We used multiple approaches to collect and compare information about the extent of downsizing, employees' perceptions of the downsizing, workplace safety and other organizational issues. Through our interviews with key individuals, focus group discussions and work-site observations, we were able to glean characteristics and themes within the workplace as perceived by the employees themselves. This qualitative data revealed aspects of employee culture and organizational climate that could not be obtained with other research techniques.

A central source of data was the responses to the *Boston University Workplace Survey*. The survey was sent to a random selection of 2793 UC employees, 579 JCNNM, and 206 PTLA employees. We received a response of 1396 (50%) of UC employees, 96 (17%) of JCNNM employees, and 78 (38%) of PTLA employees). The total LANL response rate is 45% which is lower than the other sites. When we eliminated JCNNM employees (they were not included in the analysis) the response rate increases to 49.2%. This survey, based on our review of relevant literature and knowledge gained from interviews and focus group discussion, was pilot tested at four sites, reviewed by NIOSH institutional boards and then revised.

We also reviewed archival records (including sick time data, overtime usage, downsizing data and accident and illness data, medical services utilization, etc.) for their potential use in this research.

Researchers maintained a high level of communication with employees and their communities throughout the study.

Throughout our research, we maintained the highest levels of communication with employees and members of their communities. We sponsored town and community meetings to relay information about and receive feedback on our study. We obtained informed consent from employees involved in any interview, focus group or who completed the employee survey. At various stages of the research we made available information about the study and research updates for publication in site and local media. Additionally, we established a study e-mail account and posted information on the World Wide Web. We will be presenting our results at each site

and will make available written materials at all sites and by request from researchers and on the Web.

Researchers recommend interventions that target many levels of the organization and include further research.

Our findings point to many ways to mitigate negative impacts on employee health and workplace functioning. In order to be most effective, an intervention design should address the following three organizational levels and should feature a variety of approaches. We provide here only a few examples within each category. Our complete list of recommendations can be found in the final report for LANL: The Health Effects of Downsizing in the Nuclear Industry: Findings at the Los Alamos National Laboratory.

At the policy and structural level, interventions should include, for example, programs and policies to address: any incidence of workplace harassment and violence; flexible work schedules that respond to employee concerns about workload, work demand and poor work-home balance; and preparation and training of managers who must plan or implement a downsizing or restructuring event.

Interventions that address procedures and group functioning should include, for instance: training for managers on effective supervision and communication; employee training on workplace diversity; and programs that encourage employees to respond to workplace change openly.

Individual level interventions should include, for example: sessions on exercise and stress reduction; collaboration with employees to redesign jobs or work stations; and information that use of the Employee Assistance Program will not detrimentally affect one's career.